CLAIMS:

What is claimed is:

1. A system for performing active interferometric analysis using an expressor function to detect the presence of an event of interest within an arrayed signal pattern via a computationally induced interference mechanism.

2. The system of claim 1 implemented in software.

3. The system of claim 1 wherein the arrayed signal pattern comprises either static data or dynamic data.

5. The system of claim 1 wherein the expressor function is a quantum expressor function.

6. The system of claim 1 wherein the arrayed signal pattern is in the form of one or more of a spatial 1-D array, a spatial 2-D array, an N-D array, a temporal point emitter array, a spatio-temporal point emitter array, spectral point emitter array, or a virtual array constructed by combining spatial separate point emitters.

7. The system of claim 1 wherein the arrayed signal pattern is generated from a device chosen from the group comprising: optical platforms, biomolecular platforms, ionic platforms, biomechanical platforms, optoelectronic platforms, radio frequency platforms, electronic microdevices.

8. The system of claim 1 wherein the arrayed signal pattern is generated from a device chosen from the group comprising: hybridized spotted cDNA microarrays, synthesized oligonucleotide arrays, spotted oligonucleotide arrays, peptide nucleotide assays, single nucleotide polymorphism (SNP) arrays, carbohydrate arrays, glycoprotein arrays,. protein arrays, proteomic arrays, tissue arrays, antibody arrays, antigen arrays, bioassays, sequencing microarrays, sequencing by hybridization

(SBH) microarrays, siRNA duplexes, RNAi arrays glass-based arrays, nylon membrane arrays, thin film arrays, polymer-substrate arrays, capillary electrophoresis arrays, genospectral arrays, electronic arrays, bead arrays, quantum dot arrays, glycan arrays, spotted wells, spotted well plates.

9. The system of claim 1 wherein the expressor function is designed to reject any interfering noise and background clutter from events of interest.

10. The system of claim 9 wherein the expressor function is designed so as to extract spectral invariants of events of interest associated with an array platform device used to detect the arrayed signal pattern.

11. The system of claim 1 wherein the expressor function is comprised of frequency domain sequences, time domain sequences or spectral sequences, phase sequences or numeric sequences.

12. A system for performing active interferometric signal analysis of static data from an arrayed platform in software.

13. The system of claim 12 wherein the active interferometric analysis includes detection and quantitation analysis.

14. The system of claim 12 wherein the active interferometric analysis includes constructive interferometric analysis.

15. The system of claim 12 wherein the active interferometric analysis includes destructive interferometric analysis.

16. The system of claim 12 wherein the active interferometric analysis includes software emulation of wave-particle interactions.

17. The system of claim 12 wherein the active interferometric analysis includes software emulation of wave-wave interactions.

18. The system of claim 12 wherein the active interferometric analysis includes one or more of frequency domain, time domain, or phase domain analysis.

19. The system of claim 12 wherein the active interferometric analysis exploits iterative convergence to detect resonance events.

20. A system for performing active interferometric analysis by using reverberant convergence to detect resonance events.

21. The system of claim 20 exploiting quantum interferometric analysis.

22. The system of claim 21 wherein the quantum interferometric analysis is applied to one or more of a static spatial system, a static data from arrayed measurement platforms, dynamical systems, spatio-temporal systems and plasma systems.

23. The system of claim 20 wherein the active interferometric analysis exploits non-classical noise.

24. The system of claim 23 wherein the active interferometric analysis exploits one or more of non-Gaussian noise, ergodic noise, and quantum-mechanical noise.

25. The system of claim 20 wherein the active interferometric analysis exploits resonant interferometric signal analysis using a digital representation of spectral pulses.

26. The system of claim 20 wherein the active interferometric signal analysis exploits one or more of coherent, incoherent, synchronized, or asynchronous oscillations.

27. The system of claim 20 wherein the active interferometric analysis exploits time domain or frequency domain convolution operations.

28. The system of claim 20 wherein the active interferometric analysis exploits expressor functions to detect the presence of an event of interest via a computationally induced interference mechanism.

29. A method for actively analyzing a signal pattern representative of arrayed data to identify events of interest therein, the method comprising the steps of:

inputting a signal pattern representative of arrayed data;

generating resonance patterns based on interference between synthetic noise and the signal pattern; and

detecting resonances within the resonance patterns associated with events of interest.

30. The method of claim 29 wherein the synthetic noise is in the form of one or more of a quantum expressor function, a classical expressor function, classical statistical noise, pseudorandom noise, or a systemic bias.

31. The method of claim 29 wherein the arrayed data is in the form of one or more of a spatial 2-D array, a spatial 1-D array, an N-D array, a temporal point emitter array, a spatio-temporal point emitter array, spectral point emitter array or a virtual array constructed by combining spatial separate point emitters.

32. The method of claim 29 further including the step of pre-conditioning the signal pattern prior to the step of generating resonance patterns.

33. The method of claim 32 wherein the step of pre-conditioning the signal pattern is performed by applying one or more preconditioning functions in the form of a 1-D Fourier function, a 2-D Fourier function, an N-D Fourier function, a time division multiplexing (TDM) function, a wavelength division multiplexing (WDM) function , a frequency division multiplexing (FD) function, a radial basis function, a wavelet kernel function, a fractal function, a soliton function.

34. The method of claim 29 wherein the arrayed data is generated from a device chosen from the group comprising: optical platforms, biomolecular platforms, ionic platforms, biomechanical platforms, optoelectronic platforms, radio frequency platforms, electronic microdevices.

35. The method of claim 29 wherein the arrayed data is generated from a device chosen from the group comprising: hybridized spotted cDNA microarrays, synthesized oligonucleotide arrays, spotted oligonucleotide arrays, peptide nucleotide assays, single nucleotide polymorphism (SNP) arrays, carbohydrate arrays, glycoprotein arrays,. protein arrays, proteomic arrays, tissue arrays, antibody arrays, antigen arrays, bioassays, sequencing microarrays, sequencing by hybridization (SBH) microarrays, siRNA duplexes, RNAi arrays glass-based arrays, nylon membrane arrays, thin film arrays, polymer-substrate arrays, capillary electrophoresis arrays, genospectral arrays, electronic arrays, bead arrays, quantum dot arrays, glycan arrays, spotted wells, spotted well plates.

36. A system for analyzing a signal pattern to identify events of interest within the signal pattern comprising:

an expressor function input unit;

a preconditioner unit;

an active interferometric coupler; and

a resonant marker detector.

37. A system for analyzing an arrayed signal pattern generated by an arrayed platform device to identify events of interest within the signal pattern comprising:

an expressor function input unit for inputting expressor functions;

a preconditioner unit for preconditioning the arrayed signal pattern so as to convert the arrayed signal pattern to a spectral domain in which spectral harmonics parameterize events of interest to a pre-determined dynamical system;

a coupler unit for convolving the preconditioned signal pattern and the expressor functions so as to interferometrically enhance portions of the preconditioned signal pattern associated with events of interest, if any,

present within the preconditioned signal pattern; and

a resonant marker detector for identifying occurrence of events of interest within the enhanced signal pattern.

38. The system of claim 37 wherein the signal pattern is imaged and pixilated.

39. The system of claim 37 wherein the expressor functions are designed so as to be capable of extracting one or more of spatial, spatio-temporal or spectral invariants of events of interest associated with the array device.

40. A method for analyzing an arrayed signal pattern generated by an array device to identify events of interest within the signal pattern comprising the steps of:

inputting expressor functions capable of extracting spectral invariants of events of interest associated with the array device;

preconditioning the arrayed signal pattern so as to convert the arrayed signal pattern to a spectral domain;

convolving the preconditioned signal pattern and the expressor functions so as to interferometrically enhance portions of the preconditioned signal pattern associated with events of interest, if any, present within the preconditioned signal pattern; and

identifying events of interest within the enhanced signal pattern.

41. The method of claim 40 wherein the step of convolving the preconditioned signal pattern and the expressor functions includes the step of performing a reverberation convergence between the preconditioned signal pattern and the expressor functions to achieve a resonance state.

42. The method of claim 41 wherein the step of performing a reverberation convergence is performed using an open loop control process that terminates upon detection of a predetermined condition.

43. The method of claim 40 wherein the predetermined

condition is a resonant marker corresponding to an event of interest.

44. The method of claim 40 wherein the step of convolving the preconditioned signal pattern and the expressor functions includes the step of a destructive interference between the preconditioned signal pattern and the expressor functions.

45. The method of claim 40 the step of convolving the preconditioned signal pattern and the expressor functions includes the step of a constructive interference between the preconditioned signal pattern and the expressor functions.

46. A system for analyzing a signal pattern to identify events of interest within the signal pattern comprising:

an expressor function input unit; and

an adaptive interferometric coupler operative to perform signal preconditioning, convolution coupling and resonant marker detection using the expressor functions.

47. A system for analyzing an arrayed signal pattern generated by an arrayed platform device to identify events of interest within the signal pattern comprising:

an expressor function input unit for inputting expressor functions capable of extracting spectral invariants of events of interest associated with the arrayed signal pattern; and

an adaptive interferometric coupler for preconditioning the arrayed signal pattern so as to convert the arrayed signal pattern to a spectral domain to a spectral domain in which spectral harmonics parameterize events of interest to a pre-determined dynamical system while convolving the signal pattern and the expressor functions so as to interferometrically enhance of portions of the signal pattern and to identify events of interest, if any, within the signal pattern.

48. A method for analyzing an arrayed signal pattern generated

by an arrayed platform device to identify events of interest within the signal pattern comprising the steps of:

inputting expressor functions capable of extracting spectral invariants of events of interest associated with the array device; and

preconditioning the arrayed signal pattern so as to convert the arrayed signal pattern to a spectral domain to a spectral domain to a spectral domain in which spectral harmonics parameterize events of interest to a pre-determined dynamical system while convolving the signal pattern and the expressor functions so as to interferometrically enhance portions of the signal pattern and to identify events of interest within the signal pattern.

49. The method of claim 48 wherein the step of preconditioning the signal pattern includes the step of performing a closed loop reverberation convergence between the signal pattern, as it is being preconditioned, and the introduced expressor functions to achieve a resonance state, terminated upon detection of a predetermined condition.

50. The method of claim 48 wherein the predetermined condition is a resonant marker.

51. A system for analyzing a signal pattern to identify events of interest within the signal pattern comprising:

a preconditioner unit; and

an expressor function adaptation unit operative to perform convolution coupling and resonant marker detection using canonical expressor functions.

52. A system for analyzing an arrayed signal pattern generated by an arrayed platform device to identify events of interest within the signal pattern comprising:

a preconditioner for preconditioning the arrayed signal pattern so as to convert the arrayed signal pattern to a spectral domain to a spectral

domain in which spectral harmonics parameterize events of interest to a pre-determined dynamical system; and

an expressor function adaptation unit for generating preconditioned expressor functions based on canonical expressor functions and based on the preconditioned signal pattern while extracting spectral invariants of events of interest associated with the array device and interferometrically enhancing portions the preconditioned signal pattern so as to identify events of interest, if any, within the signal pattern.

53. A method for analyzing an arrayed signal pattern generated by an array device to identify events of interest within the signal pattern comprising the steps of:

preconditioning the arrayed signal pattern so as to convert the arrayed signal pattern to a spectral domain to a spectral domain in which spectral harmonics parameterize events of interest to a pre-determined dynamical system; and

generating preconditioned expressor functions based on canonical expressor functions and based on the preconditioned signal pattern while extracting spectral invariants of events of interest associated with the array device and interferometrically enhancing portions the preconditioned signal pattern to identify events of interest, if any, within the signal pattern.

54. The method of claim 53 wherein the step of generating preconditioned expressor functions is performed so as to implicitly achieve a reverberation convergence between the preconditioned signal pattern and the expressor functions to achieve a resonance state.

55. The method of claim 53 wherein the step of generating preconditioned expressor functions is performed using a closed loop process.

56. A system for analyzing a signal pattern to identify events of interest within the signal pattern comprising:

an expressor function input unit;

a preconditioner unit;

an iterative interferometric coupler; and

an adaptive controller operative to control the iterative interferometric coupler to perform convolution coupling and resonant marker detection using the input expressor functions.

57. A system for analyzing an arrayed signal pattern generated by an arrayed platform device to identify events of interest within the signal pattern comprising:

an expressor function input unit for inputting expressor functions capable of extracting spectral invariants of events of interest associated with the array device;

a preconditioner for preconditioning the arrayed signal pattern so as to convert the arrayed signal pattern to a spectral domain to a spectral domain in which spectral harmonics parameterize events of interest to a pre-determined dynamical system;

an iterative interferometric coupler for convolving the preconditioned signal pattern and the expressor functions so as to interferometrically enhance portions of the preconditioned signal pattern associated with events of interest, if any, present within the preconditioned signal pattern; and

an adaptive controller for controlling the coupler to iteratively and selectively convolve expressor functions to the preconditioned signal pattern until a predetermined degree of convergence is achieved so as to identifying events of interest within the enhanced signal pattern.

58. A method for analyzing an arrayed signal pattern generated by an arrayed platform device to identify events of interest within the signal pattern comprising the steps of:

inputting expressor functions capable of extracting spectral

invariants of events of interest associated with the array device;

preconditioning the arrayed signal pattern so as to convert the arrayed signal pattern to a spectral domain; and

iteratively and selectively convolving the preconditioned signal pattern and the expressor functions so as to interferometrically enhance portions of the preconditioned signal pattern associated with events of interest, if any, present within the preconditioned signal pattern until a predetermined degree of convergence is achieved so as to identifying events of interest within the enhanced signal pattern.

59. The method of claim 58 wherein the step of iteratively and selectively convolving the preconditioned signal pattern and the expressor functions is performed by repeatedly convolving a single fixed expressor function to the preconditioned signal pattern using reverberant convergence until the predetermined degree of convergence is achieved.

60. The method of claim 58 wherein the step of iteratively and selectively convolving the preconditioned signal pattern and the expressor functions is performed by selectively convolving a set of different fixed expressor functions to the preconditioned signal pattern using reverberant convergence until the predetermined degree of convergence is achieved.

61. The method of claim 58 wherein the step of iteratively and selectively convolving the preconditioned signal pattern and the expressor functions is performed by selectively modifying and then convolving a dynamic expressor function to the preconditioned signal pattern using reverberant convergence until the predetermined degree of convergence is achieved.

62. A system for analyzing an arrayed signal pattern generated by an arrayed platform device to identify events of interest within the signal pattern comprising:

means for inputting expressor functions capable of extracting

spectral invariants of events of interest associated with the array device;

means for preconditioning the arrayed signal pattern so as to convert the arrayed signal pattern to a spectral domain; and

means for iteratively and selectively convolving the preconditioned signal pattern and the expressor functions so as to interferometrically enhance portions of the preconditioned signal pattern associated with events of interest, if any, present within the preconditioned signal pattern until a predetermined degree of convergence is achieved so as to identifying events of interest within the enhanced signal pattern.

63. A computer code product for actively analyzing a signal pattern representative of arrayed data to identify events of interest therein, comprising:

computer code that inputs a signal pattern representative of arrayed data;

computer code that generates resonance patterns based on interference between synthetic noise and the signal pattern; and

computer code that detects resonances within the resonance patterns associated with events of interest.

64. A computer code product for analyzing an arrayed signal pattern generated by an arrayed platform device to identify events of interest within the signal pattern, comprising:

computer code that preconditions the arrayed signal pattern based on input expressor functions so as to convert the arrayed signal pattern to a spectral domain in which spectral harmonics parameterize events of interest to a pre-determined dynamical system;

computer code that convolves the preconditioned signal pattern and the expressor functions so as to interferometrically enhance portions of the preconditioned signal pattern associated with events of interest, if any, present within the preconditioned signal pattern; and

computer code that identifies the occurrence of events of interest within the enhanced signal pattern.